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RECEIVED
OCT 31 1996
FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF SECRETARY

October 31, 1996

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, D.C. 20554

Re: *Ex Parte* Presentations in ET Dockets Nos. 96-8 (Spread Spectrum) and 96-102 (NII/SUPERNet)

Dear Mr. Caton:

On the afternoon of October 30, 1996, Burton G. Tregub of Cylink Corporation, and I discussed Cylink's positions in ET Docket No. 96-8 with the following personnel from the Office of Engineering and Technology: Dr. Michael Marcus, Ms. Karen Rackley, Mr. Charles Iseman, Mr. John Reed, and Mr. Anthony Serafini. Copies of the materials distributed at the meeting are attached. In addition, Mr. Tregub noted Cylink's concerns in ET Docket No. 96-102 as expressed in its comments.

Mr. Tregub and I also met yesterday afternoon with Mr. David P. Wye of the Wireless Telecommunications Bureau to discuss Cylink's positions in ET Docket No. 96-8. Copies of the materials distributed at the meeting are attached. During the meeting, Mr. Tregub also noted Cylink's concerns in ET Docket No. 96-102 as expressed in its comments.

Four copies of this notice are submitted in order that it may be associated with both dockets.

Please contact me with any questions involving this matter.

Respectfully,

David E. Hilliard

David E. Hilliard
Counsel for Cylink Corporation

cc: Dr. Michael Marcus, Ms. Karen Rackley,
Mr. Charles Iseman, Mr. John Reed,
Mr. Anthony Serafini, and Mr. David Wye

No. of Copies rec'd 0+3
List ABCDE

Cylink Corporation

ET Docket No. 96-8

- **Applications Need Power Above 6 dBw (4 Watts EIRP)**
  - **Intelligent Transportation Systems (e.g Traffic Light Control & Toll Collection Back-Haul)**
  - **Internet Connectivity for Schools**
  - **Energy Control**
  - **Telemedicine**
  - **Cellular and PCS Backbone**
  - **Thin Route T-1**
  - **Rural Telcos**
  - **Emergency Restoration**

- **Needs and Applications Can Be Temporary or Long Term. Part 15 Spread Spectrum Point-to-Point Links Can Fill the Gap on Short Notice.**

Ex Parte Presentation
October 30, 1996

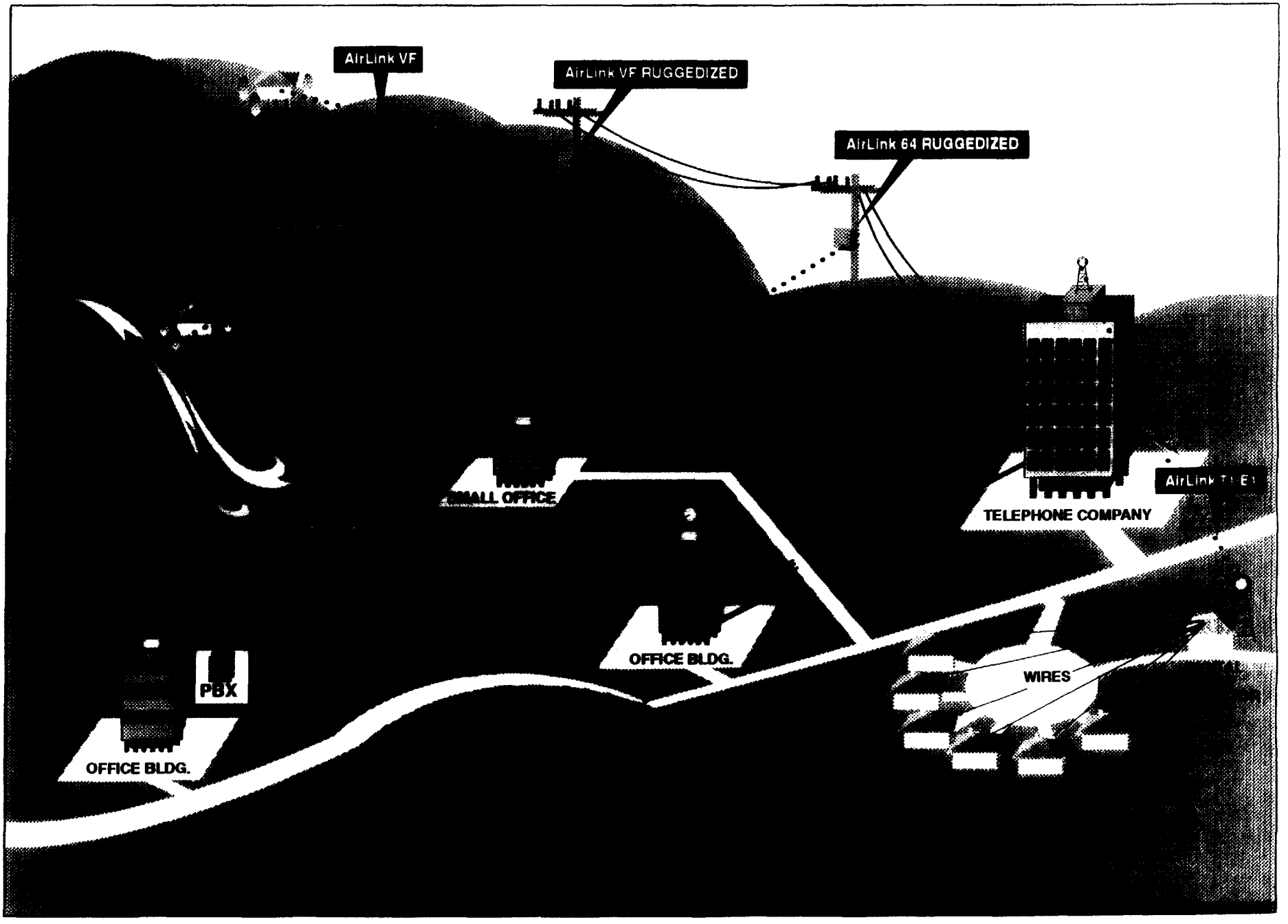
Technical Considerations

- **4 Watts EIRP at 2.4 GHz Can Support 5 Mile Links vs. 30 Mile Links Now Usable**
- **4 Watts EIRP at 5.8 GHz Can Support 7.5 Mile Links vs. 24 Mile Links Now Usable**
- **Lower Power Means More Sites; Greater Expense, and Greater Environmental Impact**
- **Higher Power is Needed to Overcome Growing ISM Noise Levels, Particularly at 2.4 GHz**
- **Point-to-Point Non-Consumer Links Have Operated for Nearly 6 Years Without Interference**
- **LANS Are More Likely to Desense Point-to-Point Systems Than Vice Versa**

Ex Parte Presentation
October 30, 1996

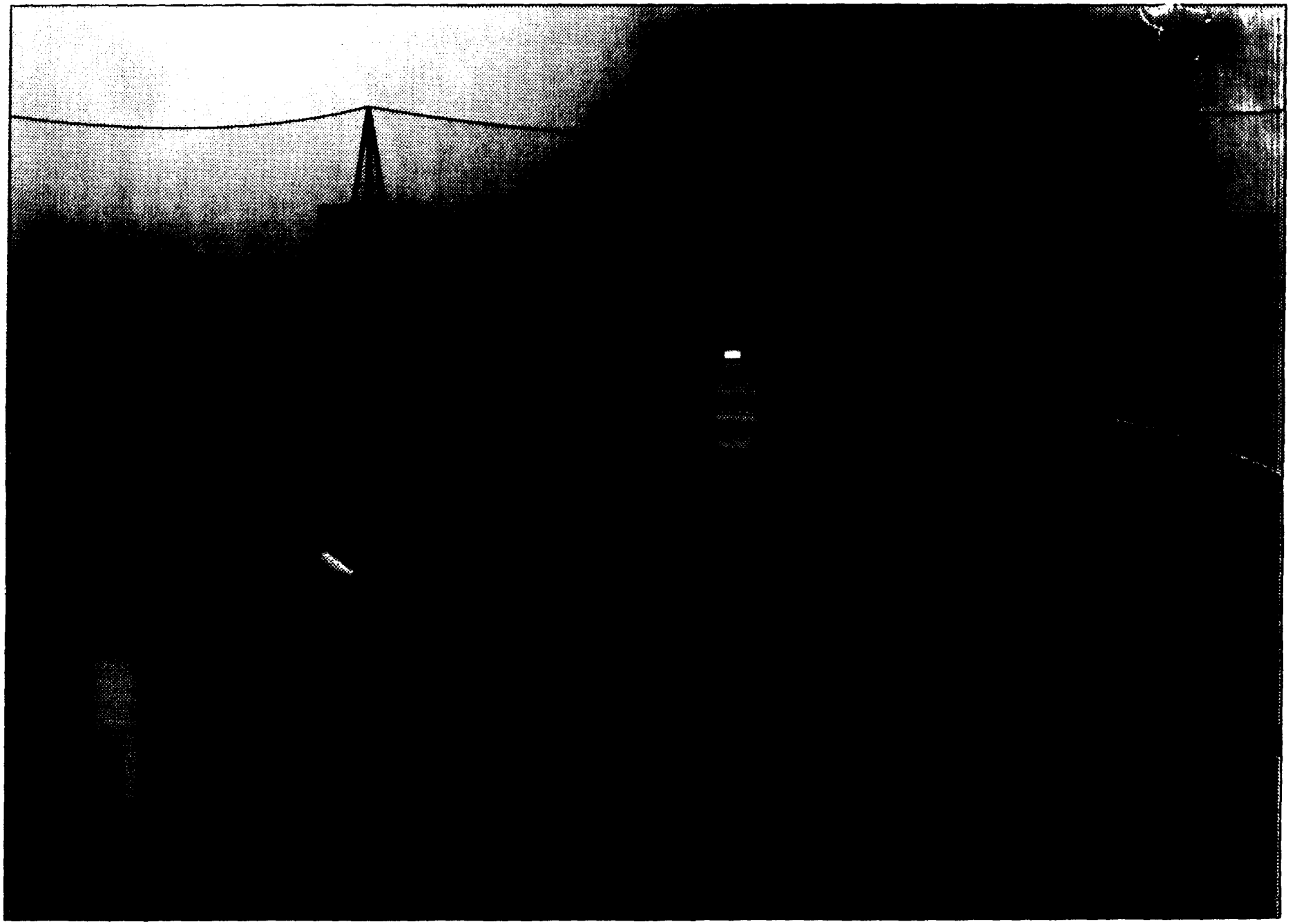
CYLINK.

AirLink™ WIRELESS LOCAL LOOP



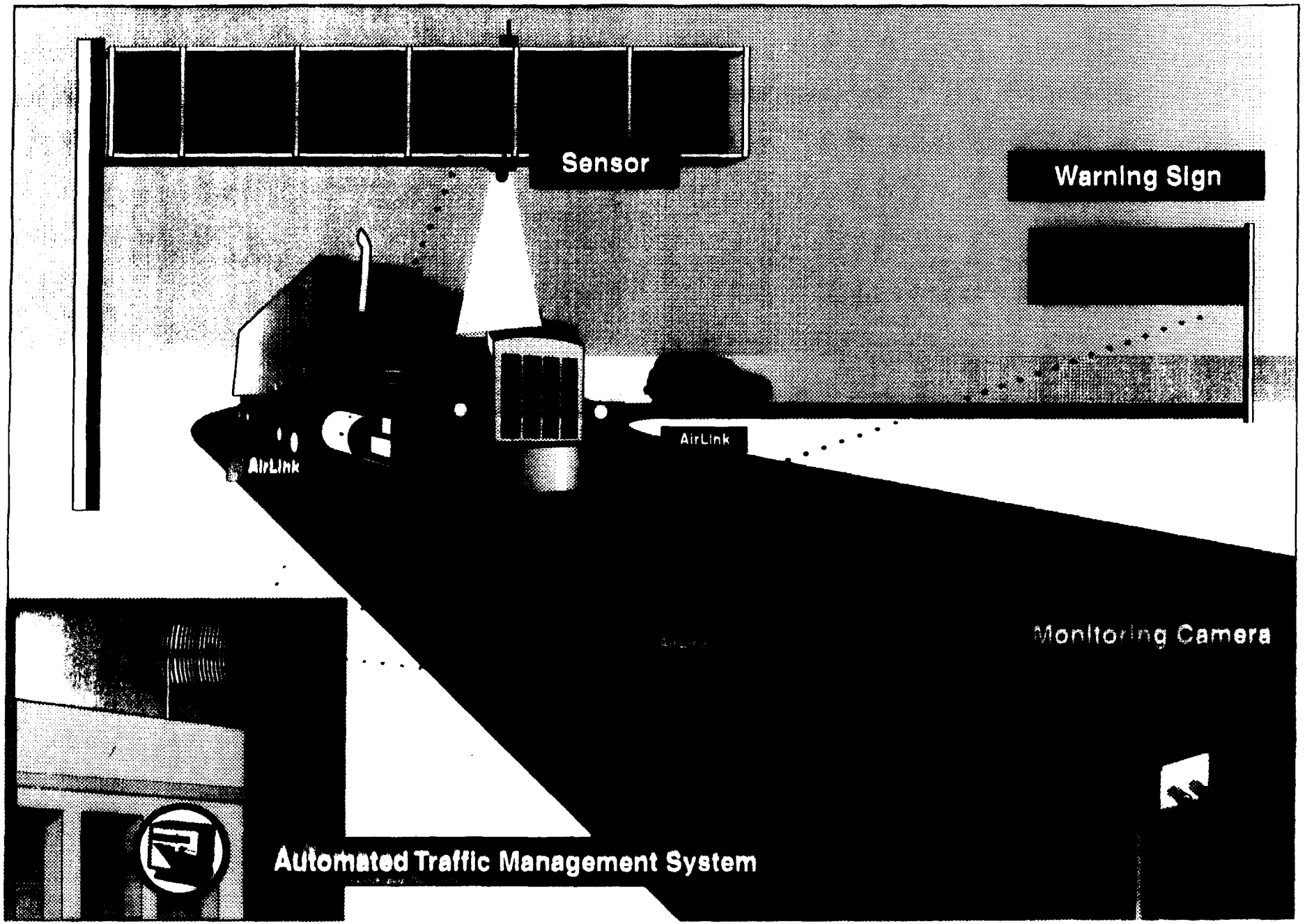
CYLINK.

AirLink™ POWER UTILITY DATA COMMUNICATIONS



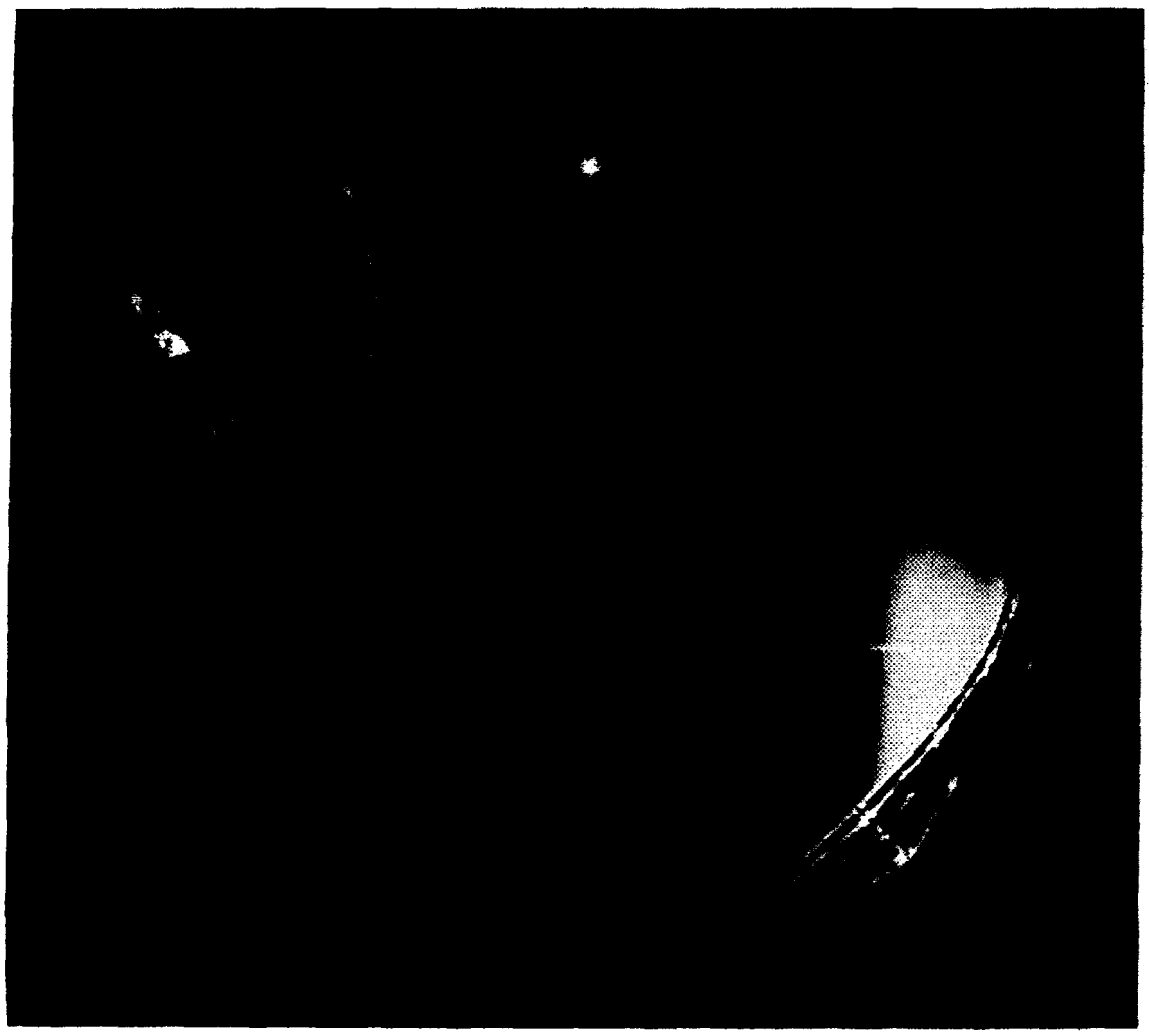
CYLINK

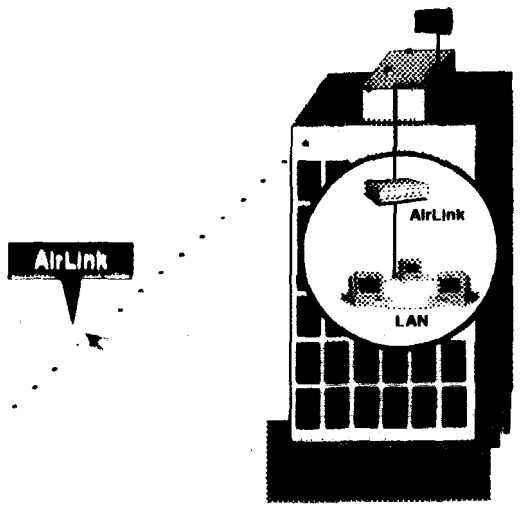
AirLink™ MICROWAVE RADIO for TRAFFIC COMMUNICATIONS

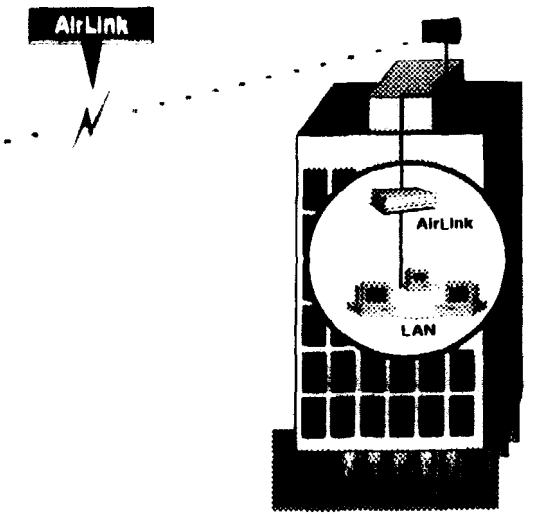


AIRCYLINK

"LAST MILE" for SATELLITE LINK

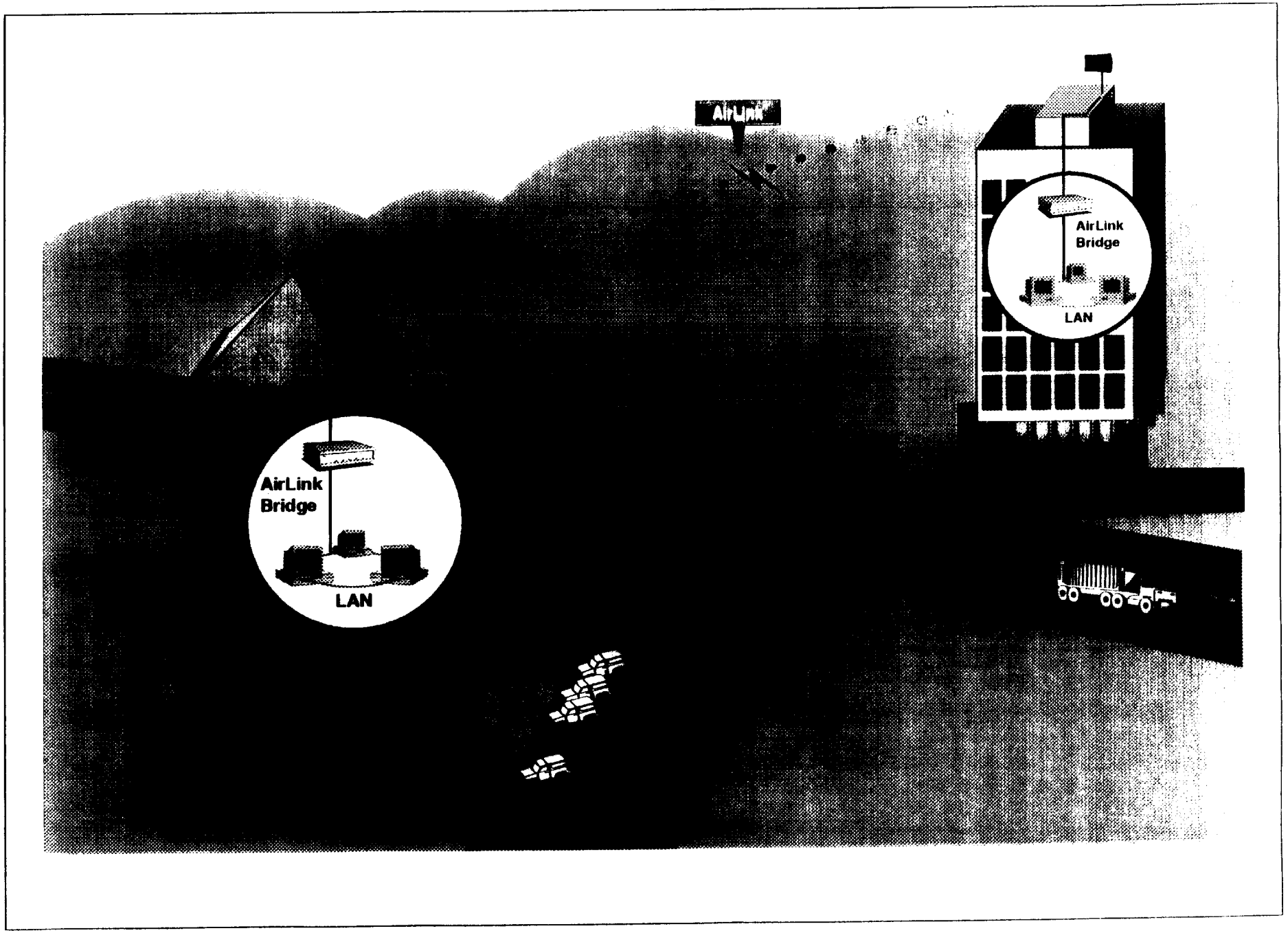






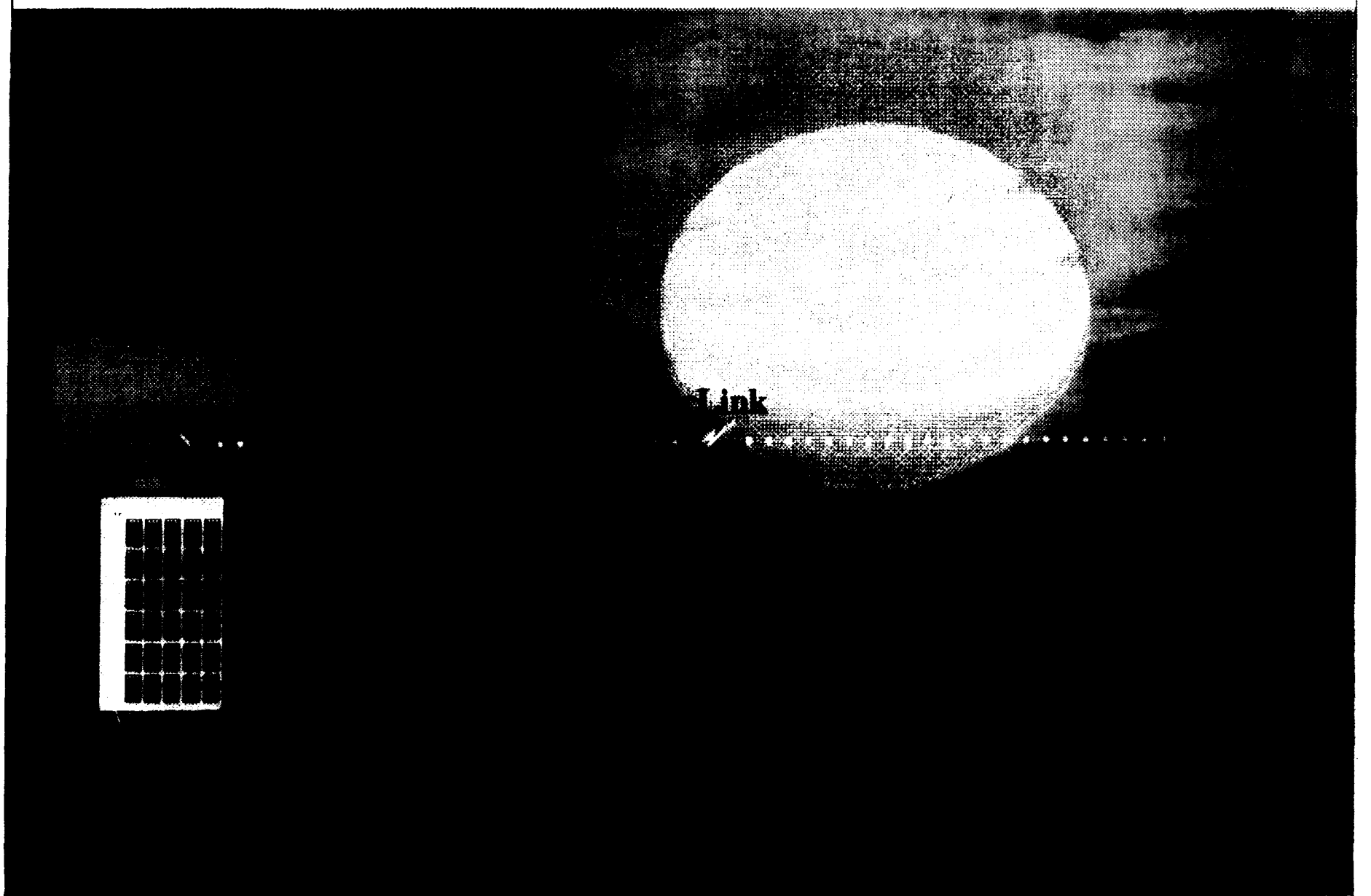
CYLINK

AirLink™ BRIDGES BRING OFFICE LANs TOGETHER



AIRCYLINK

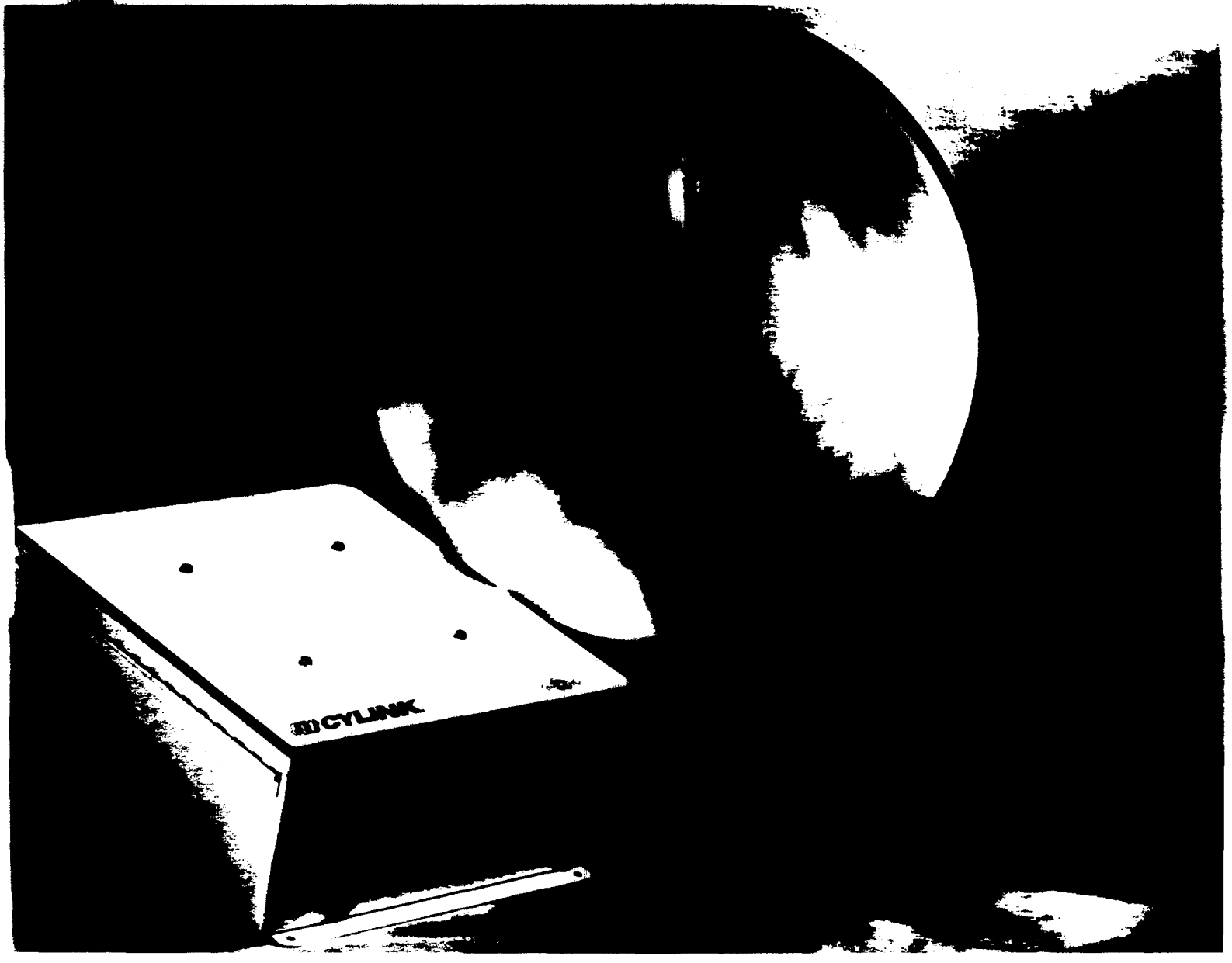
AirLink™ REMOTE OPERATIONS



AIRLINK T1/E1

AIRLINK

FAST, ROBUST, COST-EFFECTIVE WIRELESS COMMUNICATIONS



CYLINK

Get Connected — from Almost Anywhere to Almost Anything...

Running cable from a remote location to a satellite earth station or fiber backbone can be a non-trivial exercise. Often the process raises serious issues of cost and reliability.

But you don't have to face them, because there is a reliable, economical alternative. To get your communications program off the ground and solidly linked to your service provider's network, get airborne with AirLink. AirLink wireless communications provide a simple and inexpensive "last mile" solution.

Cylink antennas easily mount on a roof or mast. AirLink E1/T1 modems can be mounted indoors or outdoors under the antenna. The AirLink E1/T1 has industry-standard interfaces for direct connection to PBXs, multiplexers, routers, bridges, channel banks, and other common communications link components.

Immediately...

If you need service RIGHT NOW, and you can't get a cable in fast enough, get connected with AirLink. You'll be amazed at how quickly — and easily — the AirLink E1/T1 can have you up and running.

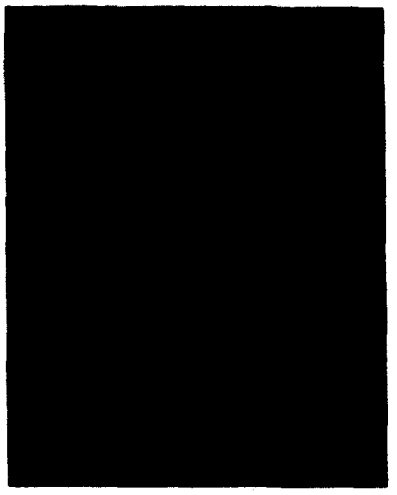
With instant, software-controlled configuration.

The AirLink T1/E1 is the first software-controlled spread-spectrum microwave modem. All the configuration is done by the installer on the spot.

To set the RF (radio frequency) output power, the installer just types it. No need to wait for the system to warm up. The software and the hardware ensure that the value typed in is the power transmitted.

To verify the communications link, technicians simply check the number of errored seconds, RF power level being received, the quality of the received signal, the alarm log, and other pertinent parameters without disturbing the T1 or E1 payload. Self test and loopback tests are built in, so the technician doesn't even need to carry test equipment.

Once the local AirLink is running smoothly, what about the far end? No need to travel to the other end



of the link to find out. Just enter the remote commands. The far-end AirLink will respond using the supervisory channel between the radios. Again, this is done without disturbing the payload.

That's the value of software-controlled AirLink radios. It's all so fast and easy.

Spread-spectrum robustness, proven in 10,000 installations worldwide,...

Incorporating spread spectrum technology, Cylink's modem is virtually immune to interference from other modems operating in the Industrial, Scientific & Medical (ISM) frequency bands. It is also inherently *private and not detectable by consumer-type scanners.*

And it's tough. Hostile environments present no challenge to this box.

In the unlikely event of a failure, a spare AirLink can be installed in minutes. Enter a few software configuration instructions and you're up and running again. There are no circuit boards to move around and no jumpers to set.

With fewer spare units needed to support a large network, Airlink brings the life-cycle cost of ownership of the network down significantly.

Cylink's spread spectrum microwave technology has been proven robust by over 10,000 modems installed around the world. When the going gets tough, the tough take to the airwaves — with AirLink.

Exceeds wireline performance.

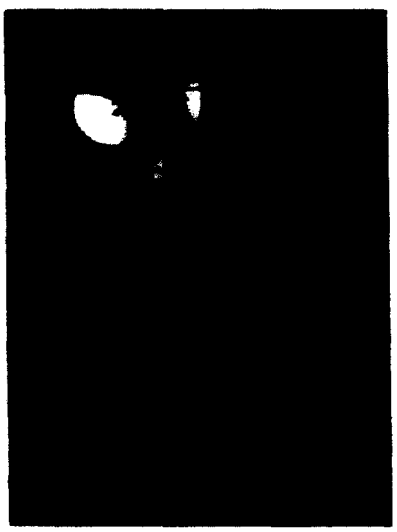
When interruptions or noise and bit errors on your wireline service become excessive, have a look at how well AirLink solves your problem.

AirLink modems beat the problems associated with long wire runs and frequent interruptions. Highly reliable service and superior performance come with every Airlink you install.

Interconnect Offices...

Rapid growth is exciting, but the growing pains can be excruciating. Just keeping all those new people in touch with each other is a serious challenge.

The solution is AirLink T1/E1.



When your site starts expanding into a campus and you're having trouble getting communications established in a timely manner, or the phone bill keeps rising just to maintain interbuilding communications, AirLink microwave radios are your best alternative.

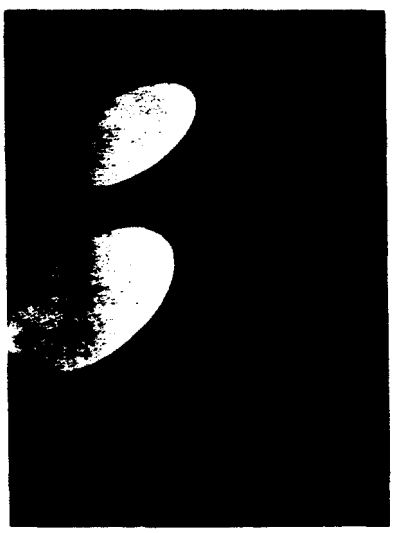
Whether the branch office is across the street, across the river, or over 20 miles (35 km) out of town, if you can see it, AirLink radios can reach it.

Swapping files, forwarding voicemail, video conferencing — it's all part of the capabilities you get with the AirLink T1/E1. Airlink T1 and E1 modems supply respectively 1.5 and 2.0 megabit full-duplex communication channels between routers, bridges or multiplexers connected to the segments of your LANs (local area networks). The AirLink radios are transparent to the protocols used.

Connect cellular, SMR, PCS, or paging microcells...

AirLink is a natural for a variety of specialized communications needs:

- Minicell and microcell sites carrying a small amount of traffic are best served by a single T1 or E1 trunk with an AirLink radio.
- Two-way paging creates a growing need for many receiver sites that AirLink fills admirably.
- Specialized Mobile Radio (SMR) and personal communications services (PCS) have similar cell sites and usually need only the thin back bone provided by an AirLink modem.



Located on hilltops or building peaks, these sites are often easier to reach by microwave radio than by cable. The AirLink family is the "best-value" solution.

And rural sites.

Many towns, villages, and work sites are too difficult to reach with cable, but easily reached by microwave radio. Place an AirLink T1/E1 in the village, put a repeater on the mountaintop and you have created a full T1 or E1 connection to the city. Now there's cost-effective communications.

Cost-effective communications solutions begin with AirLink wireless networks.

Wireless Communications at 1.544 and 2.048 Mbps with Cylink's AirLink T1 and E1 Microwave Radios

- Get Connected— from Almost Anywhere to Almost Anything...
- Immediately...
- With instant, software-controlled configuration.
- Spread-spectrum robustness, proven in 10,000 installations worldwide,...
- Exceeds wireline performance.
- Interconnect Offices...
- Connect cellular, SMR, PCS or paging microcells...
- and rural sites.

Cylink Corporation is a leader in wireless communications, and the world's largest provider of enterprise-wide network information security products. Headquartered in Sunnyvale, California, Cylink serves Fortune 500 companies, multinational corporations and many government agencies.

Other Cylink locations throughout the USA include:
Washington, DC & New York metro areas,
Colorado and Illinois.

fax on demand
USA: **800-735-6614** International: **408-735-6614**

International Sales Offices:
U. K., Singapore, China, Russia, India, Pakistan
Cylink U. K. Tel: +44-1256-841919 Fax: +44-1256-24156
Cylink Singapore Tel: 65-297-6196 Fax: 65-297-6195

CYLINK.

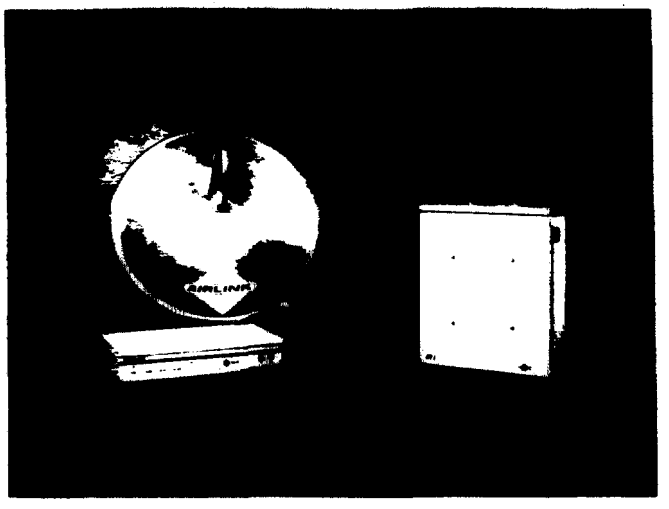
Cylink Corporate Headquarters
910 Hermosa Court
Sunnyvale, California 94086 USA
Tel: 408-735-5800
Fax: 408-720-8294

Cylink offers sales and service through a worldwide network of Distributors and VARS.

For information regarding the address or telephone number in your area please call:
800-533-3958 (USA only) or
408-735-5800 (International)
E-mail: **info@cylink.com**
Cylink home page: **http://www.cylink.com**

AIRLINK™ T1

DIGITAL MICROWAVE RADIO SPECIFICATIONS



Cylink's family of AirLink T1 wireless communication products provides solutions for high bandwidth voice and data applications. The AirLink T1 family uses spread spectrum technology for superior resistance to interference.

Benefits:

- Range up to 20 miles (35 km)
- Integrated software management allows monitoring and configuring both ends of a link remotely. Maintenance time is reduced dramatically.
- A separate administrative channel is available for maintenance purposes. This channel does not disturb the primary 1.544 Mbps traffic flow.
- The AirLink family uses spread spectrum signals in the ISM bands for interference resistant communications.
- The rack mount model is for installation in a building or hut with other equipment.
- The ruggedized model is for installation outdoors.

Models:

■ Rack Mount	APTIE-41XAF
■ Ruggedized	ALT1-4XAA

Management:

Internal Test Equipment

- Quasi-Random Sequence Generator
- Loop-Back Tests
- RF Receive Signal Quality and Level

Performance

- Errored Seconds Counts (CRC-16)
- Unavailable Seconds Counts

Major and Minor Alarms

- Transmit Power Below Threshold
- Synthesizer Loss of Lock
- Receive Power Below Threshold
- T1 Input Loss
- Radio Sync Loss
- Relay contacts close on alarm
- Dials out via modem on alarm

CYLINK.

Physical:

Rack Mount

- Dimensions: 3.5 H x 17 W x 10 D inches; 90 H x 436 W x 256 D mm
- Weight: 12 lbs. (6 kg)
- Mounting: 19 and 23 inch racks

Ruggedized

- Dimensions: 19 H x 15W x 11 D inches; 480 H x 390 W x 270 D mm
- Weight: 25 lbs. (12 kg)

Operating and Environmental:

- Temperature: -30 to +60° C (-22 to +140° F)
- Max. Altitude: 13,000 feet (4,000 meters)
- Relative Humidity: 10% to 95% non-condensing

Power Requirements:

- Voltage Range: ±21 to ±56 VDC
- Power Consumption: 25 Watts (max.)
- Optional AC: 110/220 VAC, 50/60 Hz

Interfaces:

- T1 (ANSI T1.102-1987 (DSX-1))
  - Data Rate: 1.544 Mbps
  - Coding Options: AMI and B8ZS
  - Jitter: Bellcore TR-TSY-000499 Compliant
- Order Wire
  - Rack Mount: 2 or 4 wire
  - Ruggedized: 2 wire
- Terminal: RS-232

Radio Interface:

- Frequency Band: 5.725 to 5.850 GHz
- Occupied Bandwidth: 95 MHz
- Number of Channels: 1
- Spreading Method: Direct Sequence
- Spreading Code: 8 sets of 32-bit codes
- Processing Gain: >10dB
- Operating Protocol: Time Division Duplex
- End to End Delay: 2.7 ms (nominal)

Transmitter:

- Output Power (max.): 100 mW (20 dBm)
- Software Power Control: -4 to +20 dBm in 1 dB steps
- Load Impedance: 50 ohm nominal
- RF Output Protection: short circuit

Receiver:

- Sensitivity: Better than -80 dBm @ 10^{-6} BER
- Input Impedance: 50 ohm nominal
- RF Input Protection: +10 dBm continuous without damage
- Max. RF Input Level: -25 dBm

Indicators:

Rack Mount (front and rear)

- Power
- Major Alarm
- Minor Alarm
- Sync Source
- T1 Signal Loss

Ruggedized

- Receive Signal Strength
- Transmit Power
- Test Active
- Power
- Radio Sync
- Synthesizer Lock
- Loss of Signal

Other Cylink locations throughout the USA include:
Washington DC & New York metro areas, Atlanta, Dallas, Chicago, Kansas City, and Colorado Springs
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Cylink Pakistan Tel: 92-21-584-0743 Fax:92-21-584-0727
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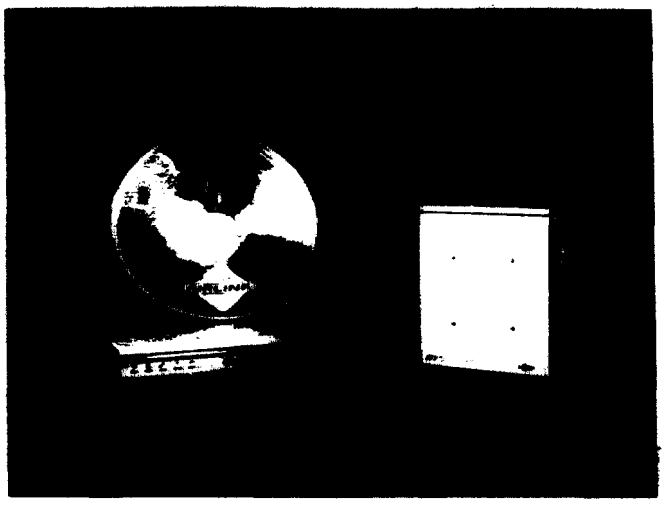
W0002-0996-5M

AIRLINK™ E1

DIGITAL MICROWAVE RADIO SPECIFICATIONS



Cylink's family of AirLink E1 wireless communication products provides solutions for high bandwidth voice and data applications. The AirLink E1 family uses spread spectrum technology for superior resistance to interference.

Benefits:

- Range up to 35 km (20 miles)
- Integrated software management allows monitoring and configuring both ends of a link remotely. Maintenance time is reduced dramatically.
- A separate administrative channel is available for maintenance purposes. This channel does not disturb the [illegible] 2.048 Mbps traffic flow.
- The AirLink family uses [illegible] signals in the ISM band [illegible] resistant communication.
- The rack mount model is for installation in a building or hut with other equipment.
- The ruggedized model is for installation outdoors.

Models:

- Rack Mount APE1E-47XAF
- Ruggedized ALE1-4XAA

Management:

Internal Test Equipment

- Quasi-Random Sequence Generator
- Loop-Back Tests
- RF Receive Signal Quality and Level

Performance

- Errored Seconds Counts (CRC-16)
- Unavailable Seconds Counts

[illegible] Alarms

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- [illegible] Loss of Lock
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Operating and Environmental:

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- Max. Altitude: 13,000 feet (4,000 meters)
- Relative Humidity: 10% to 95% non-condensing

Power Requirements:

- Voltage Range: ±21 to ±56 VDC
- Power Consumption: 25 Watts (max.)
- Optional AC: 110/220 VAC, 50/60 Hz

Interfaces:

- E1 (ITU-T G.703)
  - Data Rate: 2.048 Mbps
  - Coding Options: AMI and HDB3
  - Jitter: ITU-T G.823 Compliant
- Order Wire
  - Rack Mount: 2 or 4 wire
  - Ruggedized: 2 wire
- Terminal: RS-232

Radio Interface:

- Frequency Band: 5.725 to 5.850 GHz
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- Loss of Signal

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Cylink Russia Tel: 7-095-240-3161 Fax: 7-095-240-2516
Cylink India Tel: +91-11-617-6913 Fax: +91-11-617-6913
Cylink Pakistan Tel: 92-21-584-0743 Fax 92-21-584-0727
Cylink offers sales and service through a worldwide network of distributors and VARs


COMPLETE NETWORK SECURITY
Cylink Corporation

Inter-Ne

Started in 1984, Cylink Corporation is the world's leading provider of commercial enterprise-wide information security solutions, and the pioneer of industry-standard public key management technology. In 1990, the company introduced its line of extremely reliable, long-range, digital, spread spectrum microwave radio systems available in a wide variety of data rates. These wireless communications products are ideal for locations where wired connections are impractical. • The company is headquartered in Sunnyvale, California, U.S.A. with sales and service offices in eight countries around the world. Cylink's customers include Fortune 500 companies, multi-national financial institutions, agribusiness, construction, petro-chemical, and numerous U.S. and international government agencies.

Peace-of-mind protection for your most important investment

A LETTER FROM THE FOUNDERS

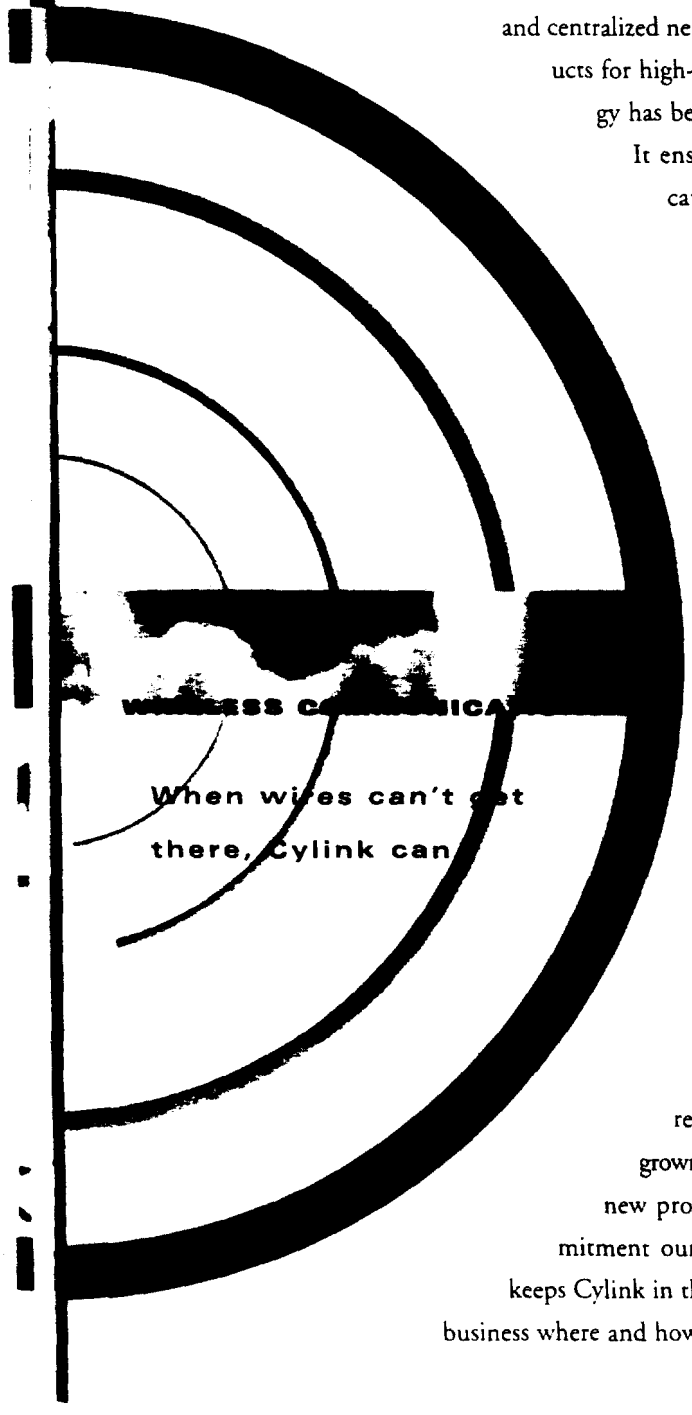
"Maintaining our solid leadership position isn't only a reflection of marketshare. In our minds, it's really about the strength of our relationship with Cylink customers. It's about our ability to respond to our customers' needs by providing the highest quality, cutting-edge information security and wireless communications solutions in a global market exploding with commerce and innovation. • When we founded Cylink in the early 1980s, it began as a mission to provide products that filled a critical void in the data security market. Our customers wanted to hop aboard the electronic information and networking bandwagon, but to do so, they had to feel completely secure transmitting their most valuable commodity — information.

A Secure Commitment. It became our commitment to pioneer this path through the development of technology and tools that not only were innovative, reliable, easy-to-use and flexible, but also provided a lasting value and were uncompromisingly secure. It was a great challenge, but we accomplished our objective. In 1984, Cylink, in collaboration with

With three trillion dollars transferred electronically each day all over the world, major banks depend on Cylink to ensure complete security.

t w o r k i n g

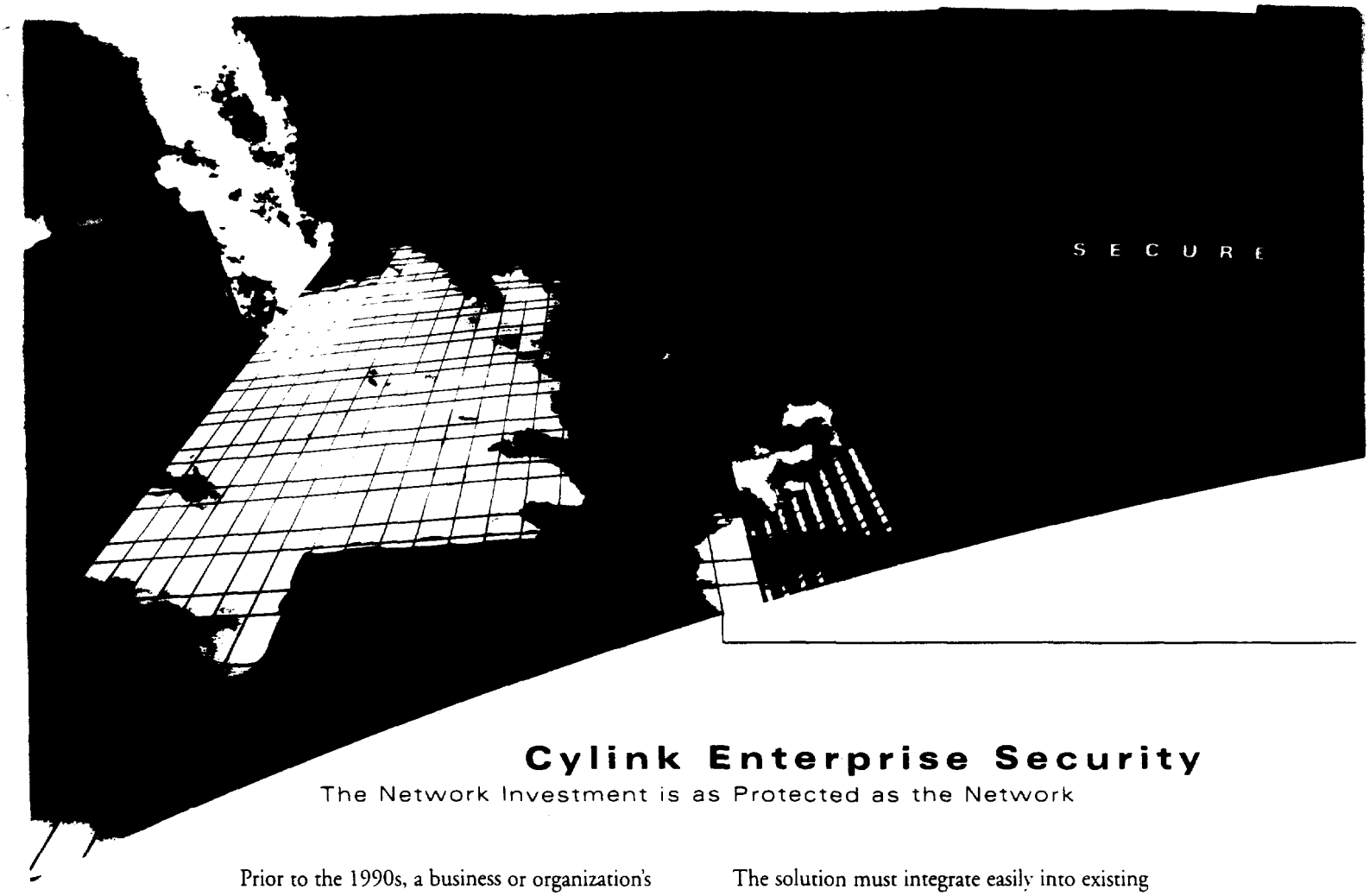
Stanford University, pioneered the commercial implementation of Diffie-Hellman public key management. We also introduced the world's first integration of this public key technology and centralized network management into enterprise-wide information security products for high-speed wide-area network (WAN) security. This enabling technology has become the universal standard for modern network data encryption. It ensures that an organization's business transactions and communications are always completely secure. • But we didn't stop there. In 1987, we pioneered the first public key management co-processor which remains the application-specific integrated circuit (ASIC) industry-standard for public key management acceleration. In 1994, we brought to market the first triple-DES (Data Encryption Standard) encryption algorithm ASIC and the first high-speed triple DES encryptor. • The banner year of 1995 resulted in several new products that changed the face of secure enterprise-wide networks forever. We introduced an advanced security library for software developers, a certificate-based access control system, a certificate-based LAN security system, and the world's first asynchronous transfer mode (ATM) cell encryptor.



The Wireless Revolution. While enterprise security solutions are our landmark business, it isn't our only business. Recognizing the developing need for a wireless data and voice communications infrastructure — where phone lines can't go — we introduced our AirLink™ family of wireless, long-range, digital microwave radio products in 1990. By leveraging our existing spread spectrum technology expertise and adding complementary narrowband products, our reputation as a single source, wireless communications provider has grown dramatically. • We continue to listen to our customers and develop new products with the same promise of high quality, reliability and commitment our name has come to represent. It is precisely this distinction that keeps Cylink in the forefront of the global marketplace, and our customers free to do business where and how they want — without limitations and with complete confidence."

— Cylink Founders Lew Morris and Jim Omura

In remote areas where wires cannot go, AirLinks make communications possible by providing the last mile solution with local telephone companies.



Cylink Enterprise Security

The Network Investment is as Protected as the Network

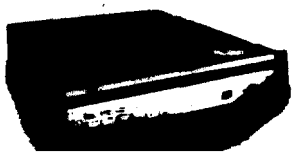
Prior to the 1990s, a business or organization's information was stored in centralized mainframes running along private networks. Security violations were rare. • However, this sense of security unraveled in the 1990s when enterprises began to take advantage of distributed client/server architectures, such as the Internet — a fundamental shift that has facilitated global business transactions. But with these open, distributed, enterprise-wide networks came unscrupulous hackers responsible for breaches amounting to losses in the millions. • This simply was not acceptable.

Security Has No Limits.

Users have always demanded an effective security solution. This solution must encompass the five critical functions of enterprise security: authentication, access, privacy, integrity and non-repudiation. The solution must integrate easily into existing networks, making migration easy and cost-effective. The approach must be seamless and fully interoperable with applications, nodes and sub-networks under a common administration, and able to run across LANs, WANs and the Internet. It must offer software development tools so organizations can create custom applications to meet their unique requirements. And of course, the best technology must provide complete security, beyond conventional network firewalls and password entry. With all these requirements, how far would a business have to go to protect its most valuable asset — information? • Not far. The secure solution has always been Cylink's family of enterprise-wide information security products.

SecureX25

SecureX25 encrypts from 32 to 512 simultaneous virtual circuits of data rates up to 64 kbps.



SecureWAN

The SecureWAN's high-speed HSi link encryptor for digital networks features the power of DES or Triple-DES encryption.

SecureAccess

SecureTraveler for Windows and SecurePocket Travele provide access for thousands of remote dial-up users

"We've got too much to lose if there's a security breach. Our data-sensitive applications travel worldwide over multiple, dedicated circuits. Cylink's encryption with both DES and proprietary regional capabilities gave us the peace-of-mind we've got to have. Security problems are now history."

- Director of MIS, large worldwide long distance communications company

"Pharmaceuticals are a competitive business. We needed easy-to-configure products and encryption to secure data links on a worldwide network that passes scientific formulas to various R&D labs. Cylink was the only company able to give us the flexibility, with high and low speed encryption capabilities."

- Vice President, MIS, multinational pharmaceutical corporation

"We have a lot of remote users — traveling trial attorneys — who must have server access 24 hours a day. The potential for an unauthorized breach is very real with dial-up connections. Now our lawyers worry about the trial; Cylink takes care of security."

- MIS Director, U.S. Department of Justice

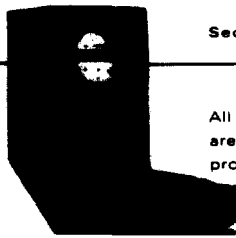
Whether communicating through the Internet or via a corporate network, Cylink security products guard your information at both ends of the network.

Leadership by Design.

At the core of Cylink's product design is the Secure Enterprise Architecture — S.E.A.Stack™ — which forms the foundation of Cylink's product families: SecureAccess™ for remote access; SecureLAN™ for enterprise local area network security; and SecureWAN™ for wide area network security. • Using its own integrated circuit technology, Cylink provides state-of-the-art performance and superior reliability. As a result, Cylink's security products don't affect network throughput like many of the traditional security alternatives available today. • Cylink also provides custom algorithms, as well as proprietary ICs, including very high-speed DES and Triple-DES encryption engines, and a specialized co-processor for public key acceleration.

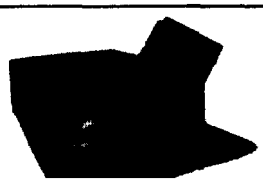
Secure Enterprise Architecture.

Cylink's S.E.A.Stack incorporates the elements required for an all-encompassing enterprise-wide security system: encryption, key management, public-key digital signatures, certificates and certificate-issuing authorities, directory services, comprehensive network security management and security protocols. • This powerful and innovative architecture provides privacy, data integrity, authentication, access control and non-repudiation throughout the network with centralized configuration and control. Cylink's key management and authentication, which is completely automated through public key cryptography techniques, makes scalability previously considered impossible, easy to accomplish. • Cylink's family of enterprise-wide information security products makes the network investment as protected as the network.



SecureLAN

All SecureLAN products are based on hacker-proof certificate and [illegible]ryption technology [illegible]he highest level of [illegible]urity available today



SecureDomain

SecureDomain and SecureNode card allow nodes, domains, subnets and networks to *communicate securely* and seamlessly

"We needed a solution that was easy to install, mobile and provided consistent high performance and reliability. Racing officials, drivers and pit crews depended on it. AirLink was the only product that met our requirements."

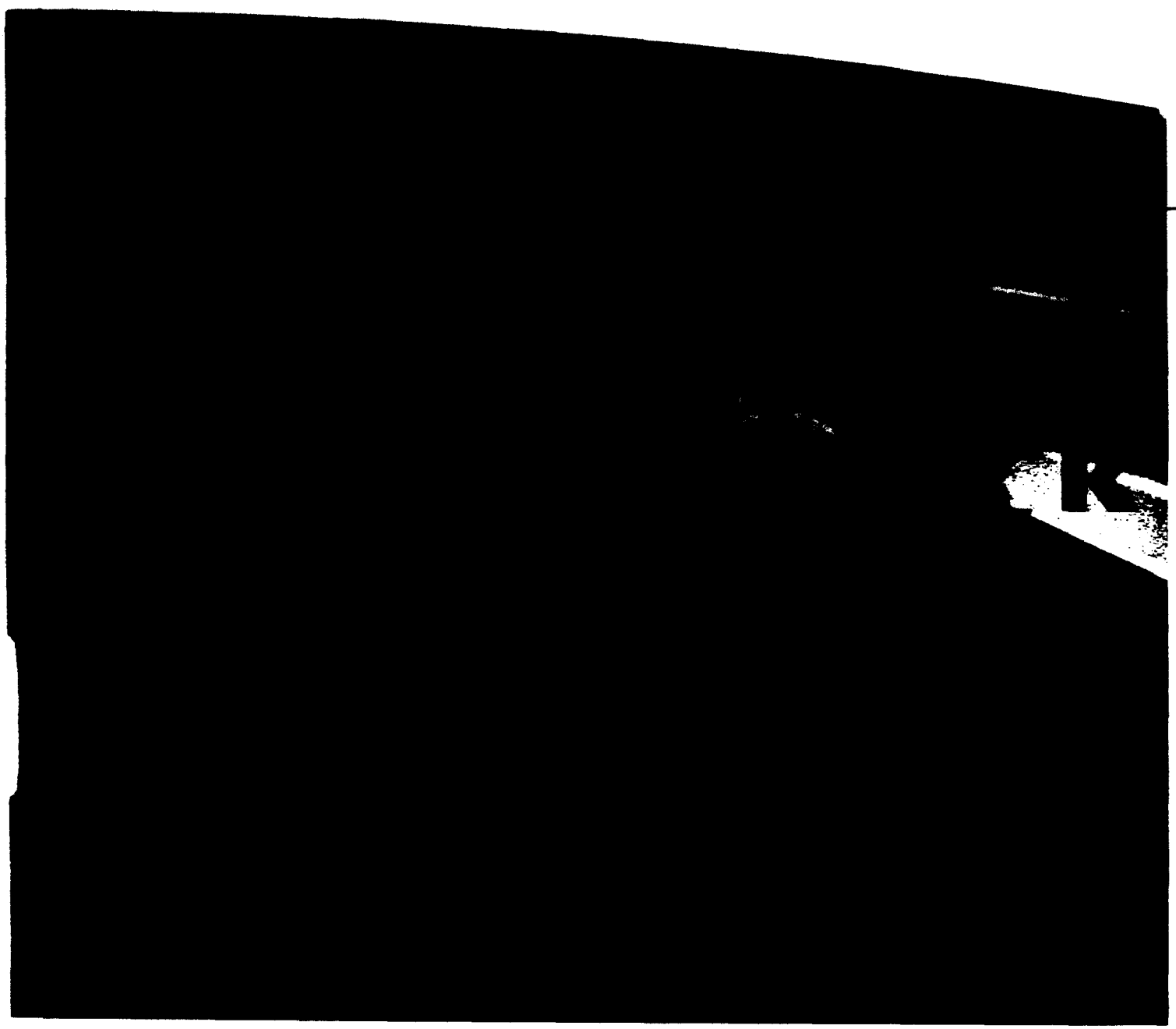
- Director of Information, U.S. sports car racing organization

"We contracted to help a Pacific Rim government "telco" deregulate to five regional companies ... in only five years! With AirLinks there were no regulatory complications, and installation was fast — requiring no tower — only a three inch mounting pipe. The cost was a fraction of laying wires."

- President, California-based distributor

"When corporate demanded better communications, we knew we couldn't afford to lay lines to our scattered farms and zone offices. And wires would be a maintenance nightmare in the jungle terrain. We had to go wireless. We chose AirLinks because of performance and reliability; we chose Cylink because of the local service and support."

- Regional Manager, Latin American fruit grower and processor



AirLink Product Family

AirLink wireless modems offer powerful point-to-point or point-to-multi-point systems — often without licenses.

Cylink offers a wide variety of antennas customized to work with the AirLink wireless modems.